What is claimed is:

1. An SDH ring network comprising:

a transmission & reception node; and

a PCA insertion & reception node, which are
interconnected in a ring form,

the transmission & reception node including,

a first function portion for setting a working path
and a protection path in advance,

a second function portion for setting a transmission
value into the K3 or K4 byte in the overhead part of an
SDH signal independently on the working path and the
protection path, and

a path switch for selecting either the working path
or the protection path depending on the state of the received
K3 or K4 byte, and

the PCA insertion & reception node including,

an insertion switch for selecting either a received
signal is to be passed through or a PCA (Protection Channel
Access) signal is to be inserted thereto, and

a bridge for dropping a received signal and at the
same time passing through the received signal.

2. The SDH ring network according to claim 1,

wherein, in regard to transmission values in the K3 or
K4 byte to be set by the transmission & reception node,

when the network is maintained in an ordinary state having
no failure, a signal condition SC indicating 'PCA

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inapplicable' is set for the working path, while a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'switchover not requested' are set for the protection path, and

5   when a failure is detected on the working path, a switch condition SWC indicating 'request for switchover' is set to transmit, and on receipt of the switch condition SWC indicating 'request for switchover', a signal condition SC indicating 'PCA inapplicable' is set for the protection

10   path.

3. The SDH ring network according to claim 1,

wherein, when receiving a pass-through signal having the signal condition SC of 'PCA applicable' in the K3 or

15   K4 byte, the PCA insertion & reception node selects PCA signal to transmit a PCA output signal, in which a switch condition SWC is replaced with the switch condition SWC received in the K3 or K4 byte of a pass-through signal input, and a signal condition SC indicating 'PCA' is set into the

20   K3 or K4 byte, and

when receiving a pass-through signal having the signal condition SC of 'PCA inapplicable' in the K3 or K4 byte, the PCA insertion & reception node selects the pass-through signal input and outputs the pass-through signal input to

25   the PCA output signal.

4. The SDH ring network according to claim 1,

wherein, when receiving a drop or pass-through signal having a signal condition SC of 'PCA' in the K3 or K4 byte, the PCA insertion & reception node selects a PCA signal in the pass-through signal input and outputs the PCA signal, and

when receiving a drop or pass-through signal having a signal condition SC of other than 'PCA' in the K3 or K4 byte, the PCA insertion & reception node outputs an alarm indication signal (AIS) in the PCA output signal.

5. The SDH ring network according to claim 2,

wherein the transmission & reception node monitors a PDH input signal and, on detection of a failure in the PDH input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA insertion node continues inserting a PCA signal.

6. The SDH ring network according to claim 2,

wherein the transmission & reception node monitors a VCn input signal, and on detection of a failure in the VCn input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA insertion node continues inserting a PCA signal.

7. The SDH ring network according to claim 2,

wherein the PCA insertion & reception node monitors a PDH PCA signal input, and on detection of a failure in the PDH PCA signal input, the PCA insertion & reception node fixes a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration without applying PCA so as to shorten a failure relief time.

8. The SDH ring network according to claim 2,

wherein the PCA insertion & reception node monitors a VCn PCA signal input, and on detection of a failure in the VCn PCA signal input, the PCA insertion & reception node fixes a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration without applying PCA.

9. The SDH ring network according to claim 3,

wherein the transmission & reception node monitors a PDH input signal and, on detection of a failure in the PDH input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA insertion node continues inserting a PCA signal.

10. The SDH ring network according to claim 3,

wherein the transmission & reception node monitors a VCn input signal, and on detection of a failure in the VCn input signal, the transmission & reception node fixes a signal condition SC indicating 'PCA applicable' and a switch condition SWC indicating 'no request for switchover' in the K3 or K4 byte for the protection path, and the PCA insertion node continues inserting a PCA signal.

11. The SDH ring network according to claim 3,
    wherein the PCA insertion & reception node monitors a PDH PCA signal input, and on detection of a failure in the PDH PCA signal input, the PCA insertion & reception node fixes a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration without applying PCA so as to shorten a failure relief time.

12. The SDH ring network according to claim 3,
    wherein the PCA insertion & reception node monitors a VCn PCA signal input, and on detection of a failure in the VCn PCA signal input, the PCA insertion & reception node fixes a selection condition so as to select a pass-through signal input, to obtain the UPSR configuration without applying PCA.

13. The SDH ring network according to claim 4,
    wherein the transmission & reception node monitors a PDH input signal and, on detection of a failure in the

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PDH input signal, the transmission & reception node fixes
a signal condition SC indicating 'PCA applicable' and a
switch condition SWC indicating 'no request for switchover'
in the K3 or K4 byte for the protection path, and the PCA
5 insertion node continues inserting a PCA signal.

14. The SDH ring network according to claim 4,
    wherein the transmission & reception node monitors a
VCn input signal, and on detection of a failure in the VCn
10 input signal, the transmission & reception node fixes a
signal condition SC indicating 'PCA applicable' and a
switch condition SWC indicating 'no request for switchover'
in the K3 or K4 byte for the protection path, and the PCA
insertion node continues inserting a PCA signal.

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15. The SDH ring network according to claim 4,
    wherein the PCA insertion & reception node monitors
a PDH PCA signal input, and on detection of a failure in
the PDH PCA signal input, the PCA insertion & reception
20 node fixes a selection condition so as to select a
pass-through signal input, to obtain the UPSR configuration
without applying PCA so as to shorten a failure relief time.

16. The SDH ring network according to claim 4,
25 wherein the PCA insertion & reception node monitors a VCn
PCA signal input, and on detection of a failure in the VCn
PCA signal input, the PCA insertion & reception node fixes

a selection condition so as to select a pass-through signal
input, to obtain the UPSR configuration without applying
PCA.

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